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AM-650
High Capacity ¼” Streaming Tape Drive Installation Instructions

PDI-00650-00, Rev. A00

FIRST EDITION: September 1997

To re-order this document, request part number PDI-00650-00

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ATTENTION: Il y a danger d'explosion s'il y a replacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type recommandé par le constructeur. Mettre au rébut les batteries usagées conformément aux instructions du fabricant.

For AM-6000 systems, replace batteries with Panasonic or Ray-O-Vac BR1225 only. Use of another battery may present a risk of fire or explosion. Replacement batteries may be ordered from your authorized Alpha Micro reseller.

Electrical Warning

This equipment contains components that can be damaged by static electricity. Follow all electronic discharge precautions when handling the equipment. For example, touch the metal back panel of the CPU or peripheral chassis to dissipate any electrical charge before touching the circuit boards or equipment within the chassis. After turning off power, before you open your computer chassis, unplug the cord from the electrical outlet to guard against electrical shock.

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The Alpha Micro Software Security Device (SSD) is a customized integrated circuit that personalizes the computer, providing identity verification for it. Certain Alpha Micro and non-Alpha Micro software may require that your computer contain an SSD in order to run software that has been customized to run only on your computer.

Please enter the identification of your SSD above. The SSD identification number should be on your computer ID label under "SSD Serial No." (Another way of finding the number is to look at the SSD itself. The SSD is located in an integrated circuit location on the CPU board; its identification number is printed on the SSD itself.) Software vendors may ask you for the SSD number if they are customizing software to run only on your computer.

This document may contain references to products covered under the following U.S. Patent Number(s): 4,530,048

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INTRODUCTION

This document describes the installation of an AM-650 (Tandberg MLR-1) SCSI 1/4" magnetic streaming tape drive into an existing Alpha Micro computer system.

If you are installing an AM-650 tape drive into an external subsystem, use the installation instructions shipped with the subsystem in conjunction with the drive-specific instructions in this document.

These instructions are written for the experienced Alpha Micro Service Technician, so if you do not feel comfortable performing the hardware and software procedures discussed below, please contact your Alpha Micro dealer or the Alpha Micro Technical Assistance Center for help.

PRODUCT DESCRIPTION

AM-650 is the Alpha Micro model name for the Tandberg MLR-1 magnetic tape drive. The AM-650 has a storage capacity of up to 26 GB, depending on the type of data cartridge and compression method used. The AM-650 can read and write to all of the following types of tape cartridges:

3M Cartridge	Capacity
DC6150	150MB
DC6250	250MB
DC6320	320MB
DC6525	525MB
Magnus 1.0	1GB
Magnus 2.0	2GB
Imation 13GB	13GB or 26GB

These are maximum tape use figures. The actual amount of data you will be able to back up on a tape depends on the number and size of the files being copied.

See the section “Reading and Writing Different Tape Formats,” later in this document, for information on using different types of tape cartridges and setting data formats.

The AM-650 streaming tape product installation package consists of the tape drive itself and, possibly, a mounting kit. Whether you get a mounting kit, and what is included in it, depends on the type of computer chassis you have. The chart below shows which mounting kit goes with your chassis:

Chassis Type	Mounting Kit
Rack Mount	PDB-00625-60
Pedestal	PDB-00625-61
AM-990	Not required
Eagle Deskside	Not required

Make sure you have the correct mounting kit before you begin. If you’re replacing an existing streaming tape drive, you don’t need a new mounting kit, regardless of your type of computer. The mounting hardware for your existing drive will work with the AM-650.

The AM-650 has the same environmental specifications as your computer.

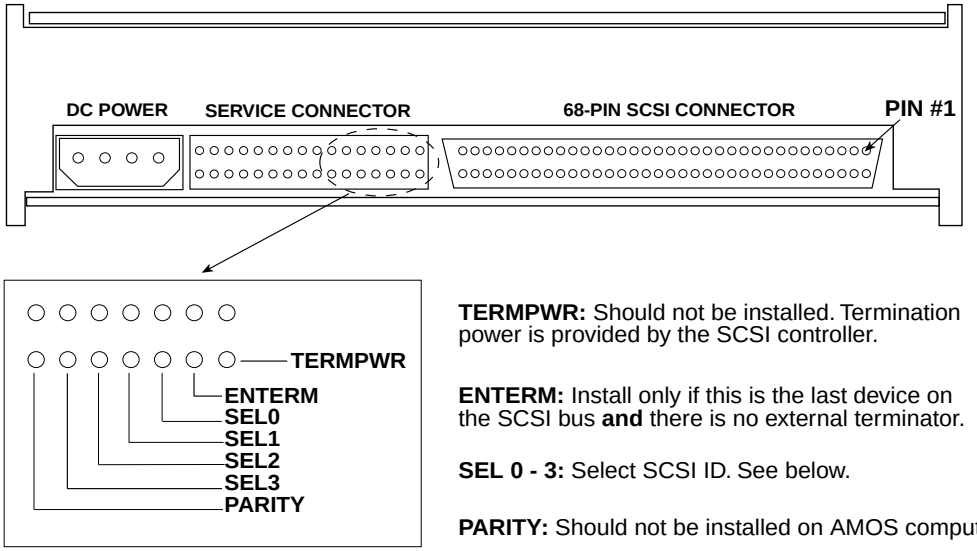
The AM-650 is supported only on the SCSI-2 bus (either narrow or wide). It is not supported on the SASI bus found on older AMOS computers.

TOOLS REQUIRED

For most installations, the only tool you will need to install the AM-650 is a #2 Phillips-head screwdriver.

PREPARING THE AM-650 FOR INSTALLATION

Before installing the AM-650, you should make sure its configuration jumpers are set correctly. These jumpers are found on the back of the tape drive, as shown in Figure 1. Specifically, you need to set the jumpers determining the SCSI ID for the drive, and make sure the termination jumper is set correctly. The next few sections discuss SCSI IDs and SCSI bus termination.



TERMPWR: Should not be installed. Termination power is provided by the SCSI controller.

ENTERM: Install only if this is the last device on the SCSI bus **and** there is no external terminator.

SEL 0 - 3: Select SCSI ID. See below.

PARITY: Should not be installed on AMOS computers.

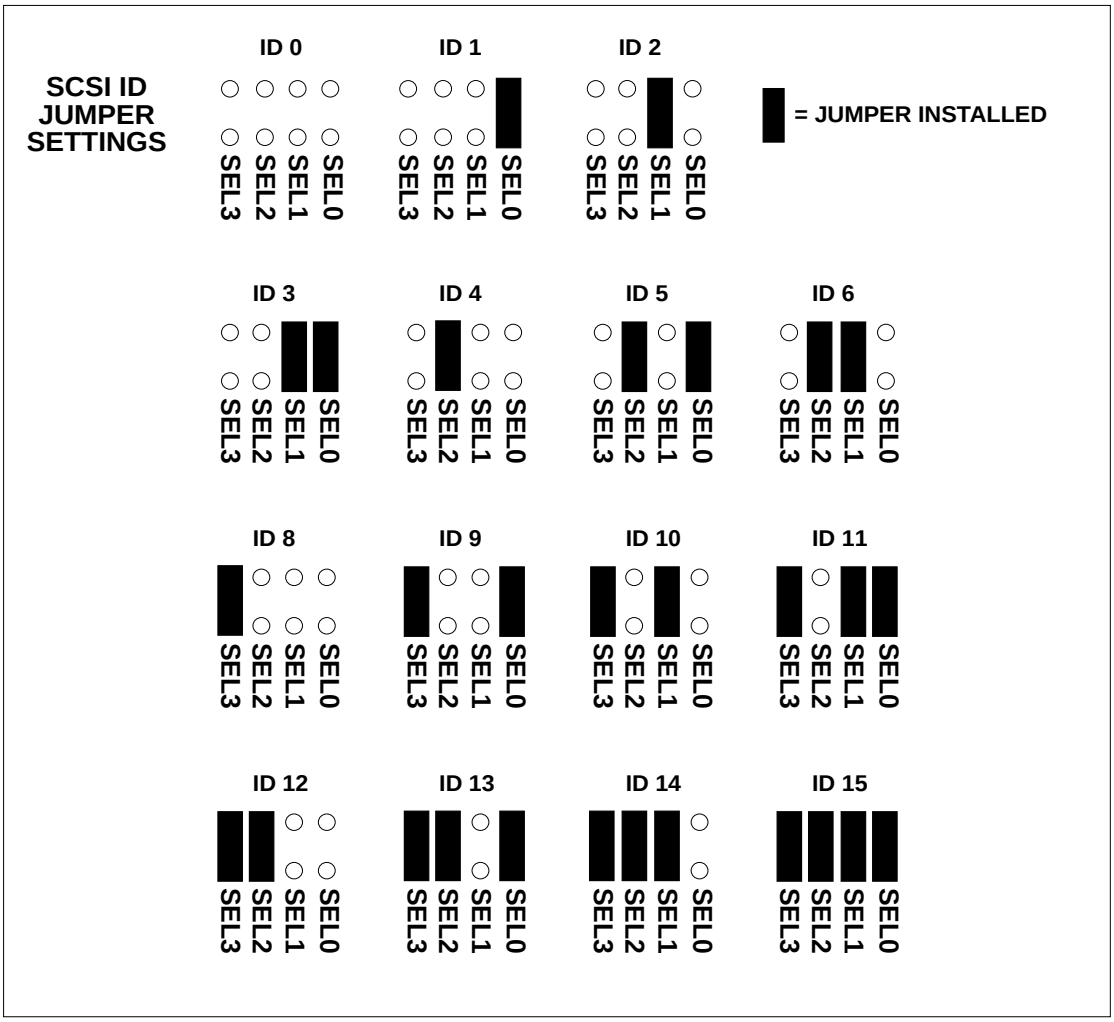


Figure 1 - AM-650 Tape Drive Rear Panel

Setting the SCSI ID

Each SCSI device attached to the SCSI bus must be set to a unique address. Two SCSI devices cannot share the same address. The AM-650 is a Wide SCSI-2 device, and can therefore be set to any SCSI ID from 0 through 15 (except 7, which is reserved for the SCSI controller). On the narrow SCSI bus supported on AMOS computers prior to the AM-6000 (and optionally on the AM-6000), you can use only IDs 0 through 6. Figure 1 shows the jumper settings for each SCSI ID.

If you have an AM-650 on a Roadrunner 030/040 or an Eagle other than the Super Eagle, and you want to be able to warm boot from it, it must be set to a higher SCSI ID than any other tape device on the SCSI bus.

SCSI BUS TERMINATION

To function properly, the SCSI bus on your computer must be terminated at each end. The SCSI controller terminates one end of the bus; the opposite end of the bus can be terminated in one of two ways: 1) using the preferred method—an external terminator, or 2) installing on-board terminators in the peripheral that's ***at the other end of the SCSI cable***. You should use method 2 only if, for some reason, you cannot use an external terminator.

External SCSI Bus Termination

The preferred way to terminate the SCSI bus in an AMOS computer is to install an external terminator. Using an external terminator makes it easier to install an add-on subsystem (like a portable CD-ROM drive), eliminating the need to remove terminators from a SCSI device inside the computer.

The AM-650 is very sensitive to termination issues. Any computer with an AM-650 installed ***requires active termination*** of the SCSI bus. Currently (September 1997), only AM-6000 and Roadrunner 060 computers include an active terminator as standard equipment; other AMOS computers come with a passive terminator. If your computer has a passive terminator, replace it with an active one before using the AM-650. Many active terminators say “active” somewhere on their housing.

External active terminators are available from Alpha Micro under part numbers PRA-00222-20 (wide active terminator) and PRA-00222-21 (narrow active terminator).

To use the external terminator, you need to insure none of the SCSI devices inside the computer are terminated. You also need to follow the guidelines in the section on providing termination power to the SCSI bus, below.

10 and 21-slot rack mount VME computers have no external SCSI connector. To install an external terminator, you need a special adapter cable, DWB-10200-01. The connector on this cable is compatible with the external terminator and also allows you to easily attach a portable CD-ROM drive or other SCSI device.

Figure 2 shows both narrow and wide SCSI terminators:

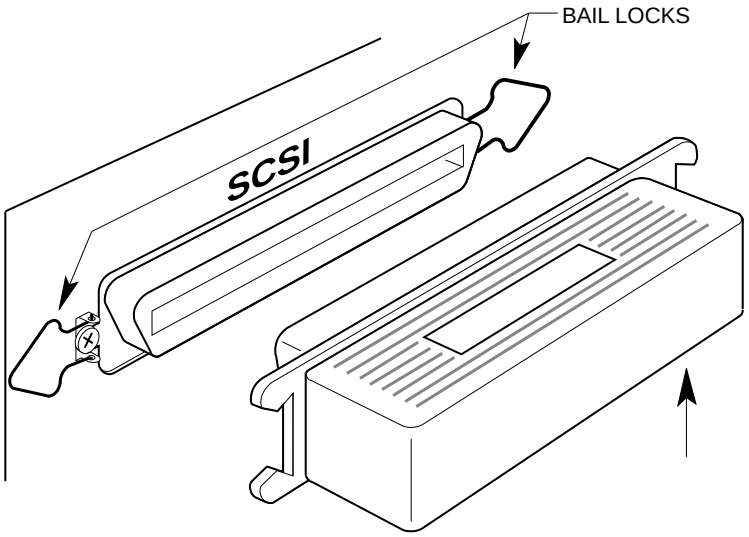


Figure 2a - External SCSI Terminator - Narrow

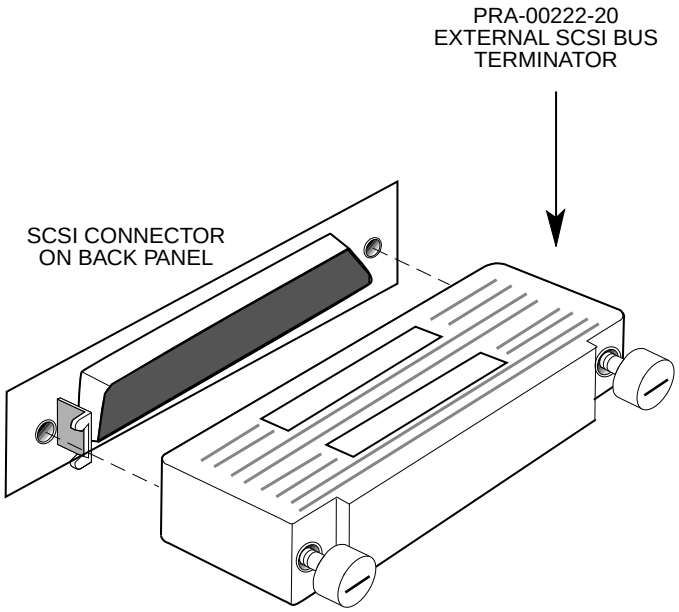


Figure 2b - External SCSI Terminator - Wide

The illustrations show two different types of external SCSI connectors:

1. The top picture shows an external narrow SCSI connector and bail locks for holding the terminator in place. This configuration is used on most of Alpha Micro's currently available product. The terminator is installed by plugging it onto the connector, then latching the bail locks into the notches on the sides of terminator.
2. The bottom picture shows an external Wide SCSI connector. The terminator is held in place by thumb screws.

Internal SCSI Bus Termination

If you are not using external SCSI termination, you may terminate the SCSI bus by enabling the termination resistors on the last SCSI device—the one farthest away from the SCSI controller. For best termination and most reliable SCSI performance, ***this device should be at the actual physical end of the SCSI cable***. If the SCSI cable extends beyond the device which provides termination, even if there are no more devices attached, termination will not be as reliable as it would be if the actual end of the cable was terminated. As mentioned above, because of its high performance, the AM-650 is more sensitive to termination issues than earlier tape drives.

Be sure that ***only the last SCSI device*** has its on-board termination enabled. If more than one device on the SCSI bus has its termination enabled, your system will probably perform erratically! This is true whether the last device is in the computer chassis or in a separate subsystem chassis.

If the AM-650 is the last device on the SCSI cable, and you are not using an external terminator, you should enable termination by installing the ENTERM jumper on the back of the drive, as shown in Figure 1.

TERMINATION POWER

To control SCSI bus termination properly, a termination power source must be provided; ***this is especially important when using an external terminator.***

Why is Termination Power so important when using an external terminator?

Any terminator must have a power source. Because an external terminator does not have its own source of power, it must get its termination power from the SCSI bus. If termination power is not available on the bus, the external terminator cannot do its job, which means your SCSI bus will not be terminated properly. This may result in a computer that won't boot, or that "hangs" frequently. As mentioned above, the AM-650 is more sensitive to improper termination than were older tape drives.

All AMOS computers using the SCSI-2 or Wide SCSI-2 bus should be configured to supply termination power ***via the host controller***. When SCSI bus termination power is supplied by the host controller, no SCSI peripheral should supply termination power to the bus.

SCSI subsystems attached to the main system should not have any additional devices supplying termination power to the SCSI bus. Termination power should be supplied by the SCSI controller only!

For information on how to configure terminator power on SCSI hard disks and other magnetic tape peripherals, see the following documents:

- Each SCSI disk drive shipped by Alpha Micro has a one-page notice with jumper configuration information, including instructions on configuring termination power.
- *AM-62X SCSI 1/4" Streaming Tape Drive Installation Instructions,* PDI-00625-00, revision A07 or later.
- *AM-647, 648, and 649 Digital Audio Tape (DAT) High Capacity Tape Drive Installation Instructions,* Rev. A01 or later.

INSTALLING THE AM-650

The following sections explain how to install the SCSI streamer and cable it to your computer, based on the type of computer you have. Find the heading for your computer chassis and follow the instructions.

Follow the instructions in your computer *Owner's Manual* for turning off the power to each component. Be sure to observe the cautions concerning electrostatic discharges and grounding.

Pedestal and Rack Mount Computer Installation

The following sections describe how to install the tape drive into pedestal and rack mount AMOS computers. The basic installation procedure is the same for both types.

FRONT BEZEL MODIFICATION

If you are replacing an existing tape drive, your bezel has already been modified. You can skip this step.

Before you install the AM-650, you need to modify your computer's front bezel, creating the necessary cutout to support the tape drive. The instructions for modifying your front bezel are contained in two separate documents, which are included with your product installation kit:

- PDI-20135-00—contains the instructions for modifying the front bezel on rack mount computers.
- DSS-10521-00—contains the instructions for modifying the front bezel on pedestal computers.

Complete your bezel modification (using the proper instructions) before going on to the next step in this procedure.

BUILDING AND INSTALLING THE TAPE DRIVE MOUNTING ASSEMBLY

The drive mounting assembly is the same for both pedestal and rack mount computers. The assembly consists of three pieces: one plastic mounting base, one tape drive, and one metal support bracket. The following steps describe how to put the assembly together:

1. Set the drive on top of the plastic mounting base with its status LEDs away from the plastic mounting base. This insures the drive is in its proper position for both pedestal and rack mount computers. See Figure 3.

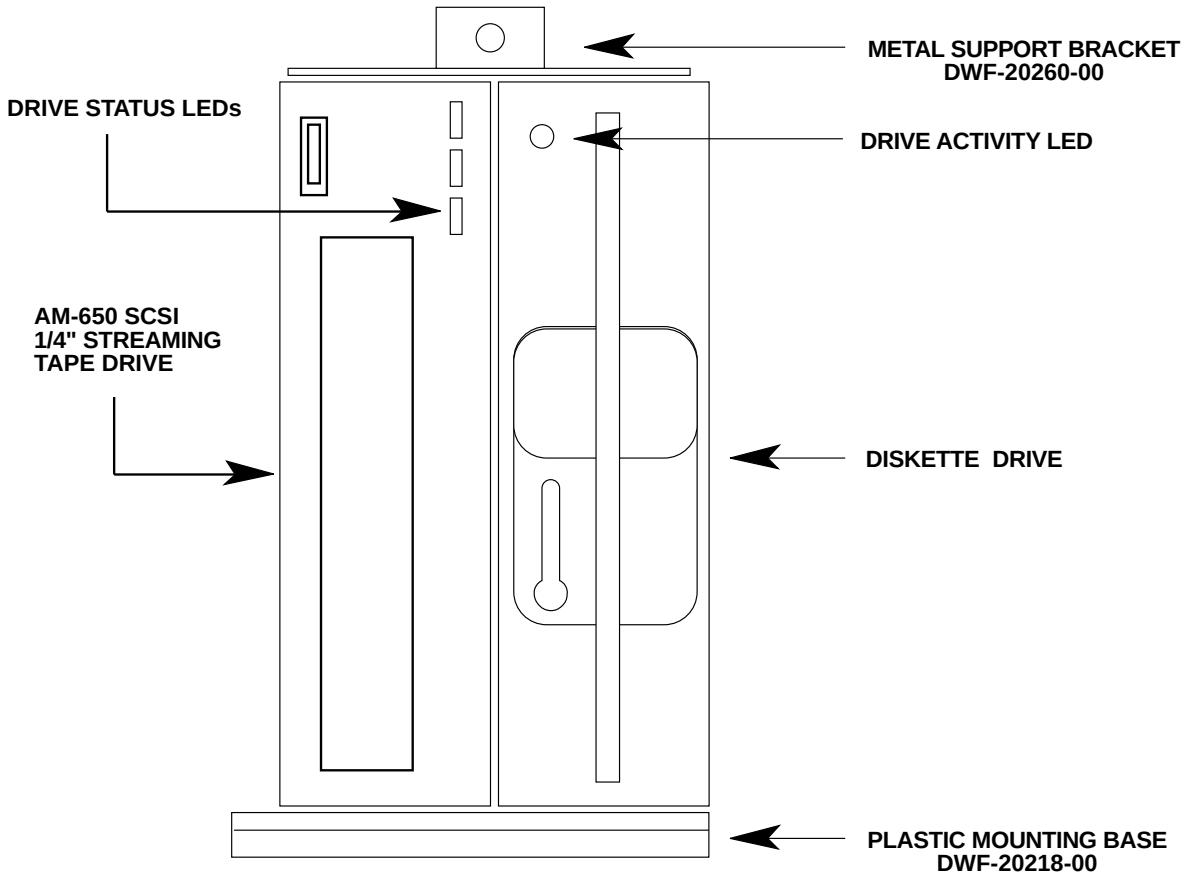


Figure 3 - Tape Drive Mounting Assembly

2. The AM-650 has a number of mounting screw holes on its side. There are corresponding holes in the plastic mounting base. Align the screw holes on the drive with the designated holes in the mounting base (marked as A in Figure 4). Make sure the drive's front panel is pointed in the direction indicated by the arrow.
3. Install the two screws (included in the mounting kit) that hold the plastic mounting base to the drive. If you are installing a diskette drive or another tape drive along with your AM-650, mount this drive next to the AM-650, as shown in Figure 3.

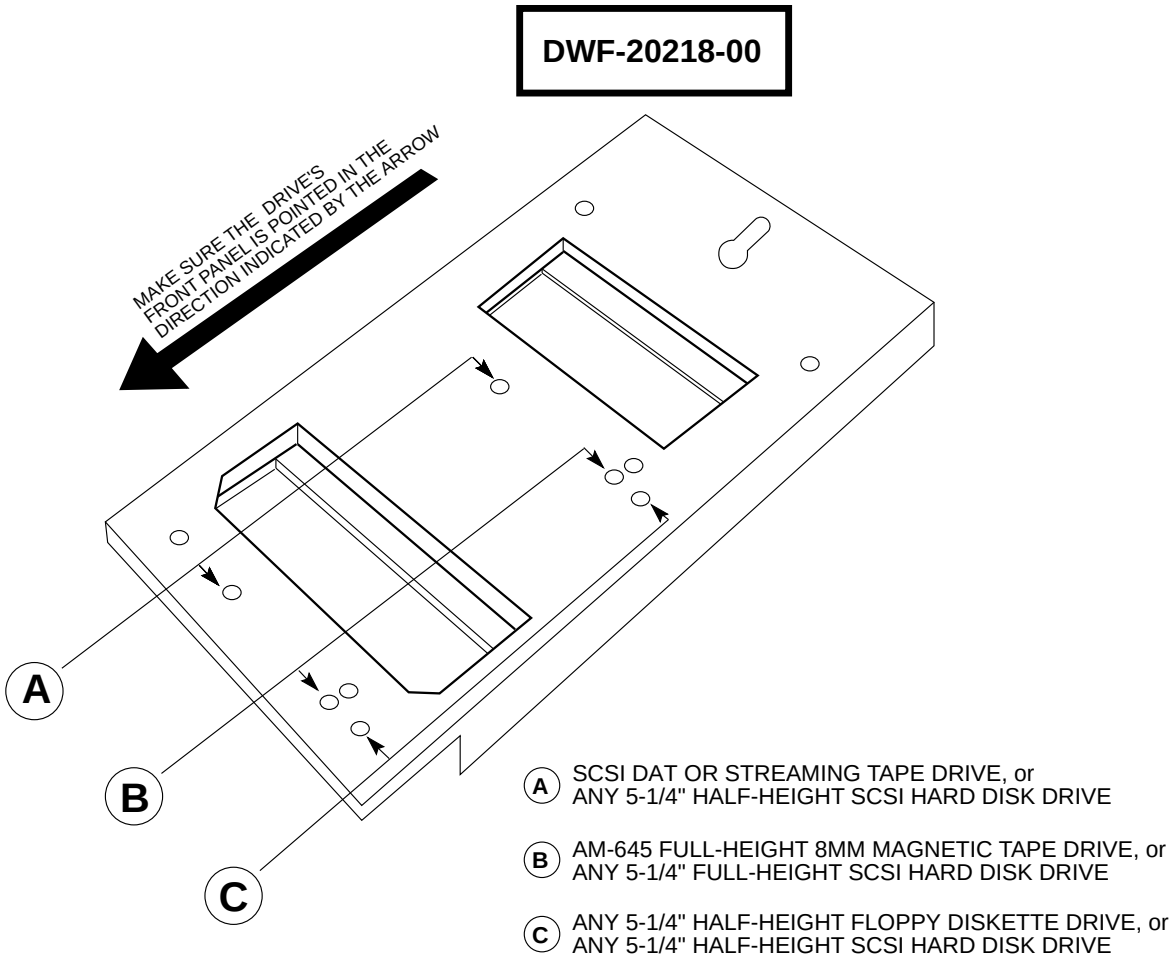


Figure 4 - Plastic Mounting Base

4. Set the drive assembly into its mounting position inside the chassis.
5. Set the metal support bracket on top of the drive assembly as shown in Figure 3. Position the bracket so the mounting hole shown in Figure 5 aligns with the screw hole on the side of the AM-650, and the screw hole to attach the drive assembly to the front bezel aligns with the screw hole in the front bezel.

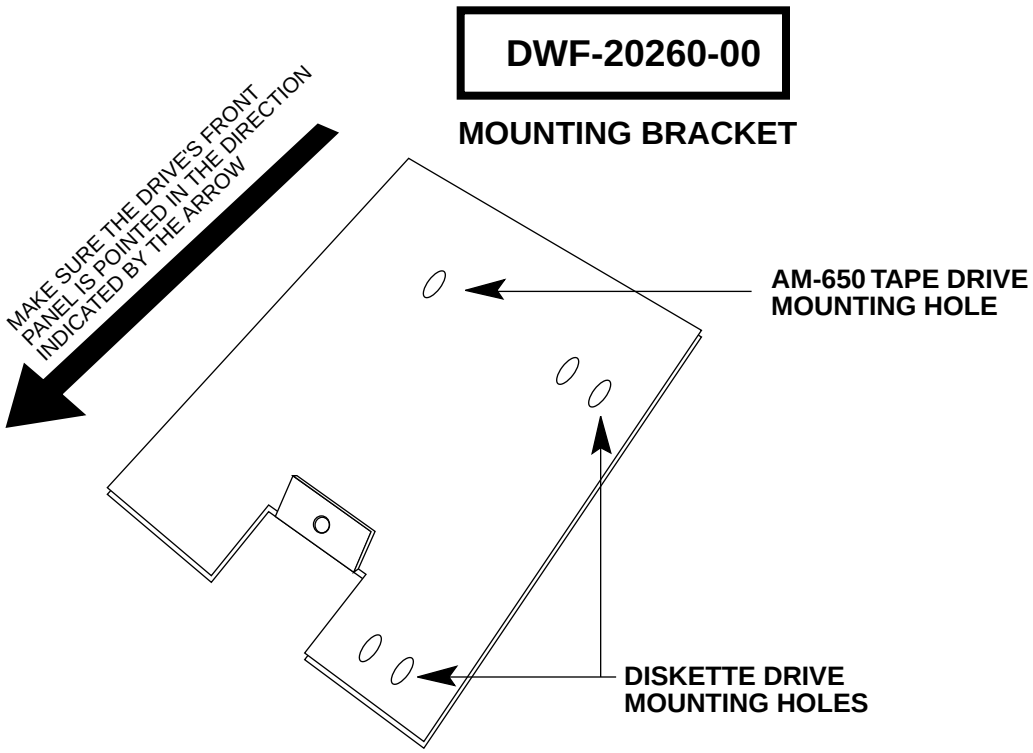


Figure 5 - Metal Support Bracket

6. Because the tape drive internally ties logic ground to its frame, you need to isolate the tape drive from the computer chassis. Use the two nylon shoulder washers (part number HDW-10004-07) to ensure that the metal support bracket does not touch the conductive coating on the front bezel. Please refer to Figure 6 for correct installation of the shoulder washers.

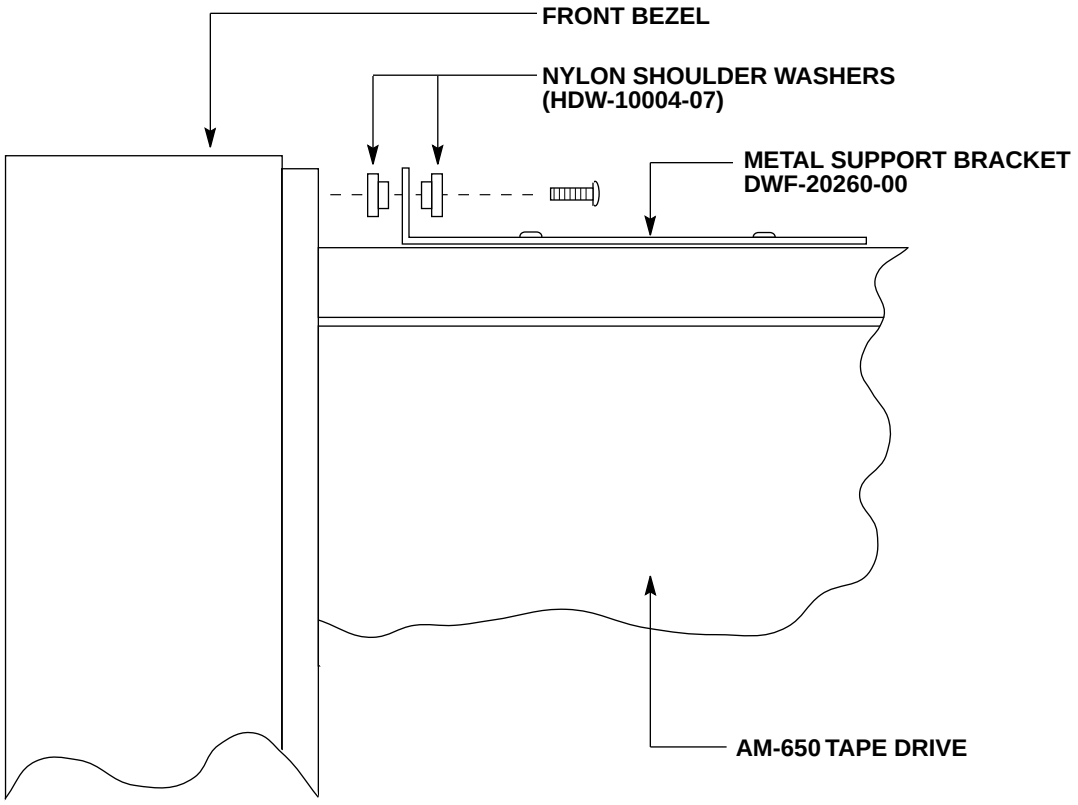


Figure 6 - Attaching to Front Bezel

7. Before you tighten the screw holding the tape drive to the metal support bracket, make sure you are satisfied with the way the drive assembly is aligned with the cutout in your computer's front bezel. Once the drive (or drives) are properly positioned, install the screw that holds the plastic mounting base to the chassis bottom and tighten the screw holding the drive (or drives) to the metal support bracket.

ATTACHING THE POWER AND INTERFACE CABLES

Once the AM-650 is mounted in the chassis, attach the power cable from the power supply to the four-pin connector on the drive.

Attach the Wide SCSI cable to the 68-pin connector on the drive. The drive’s connector is keyed so the cable can only be attached correctly.

If you are attaching the drive to a 50-pin narrow SCSI cable, you must use an adapter between the 50-pin cable and the 68-pin connector on the drive. This adapter is provided with the AM-650.

AM-990 Chassis Installation

The AM-650 is installed in the AM-990's main drive bay using plastic mounting rails. You need two rails to mount the drive (or any peripheral device). The rails (DWF-20652-00) are included with the computer chassis and are universal; they can be mounted on either the right or left side of the drive.

Figure 7 shows one of the rails and explains how they are used with various types of peripherals, including the AM-650:

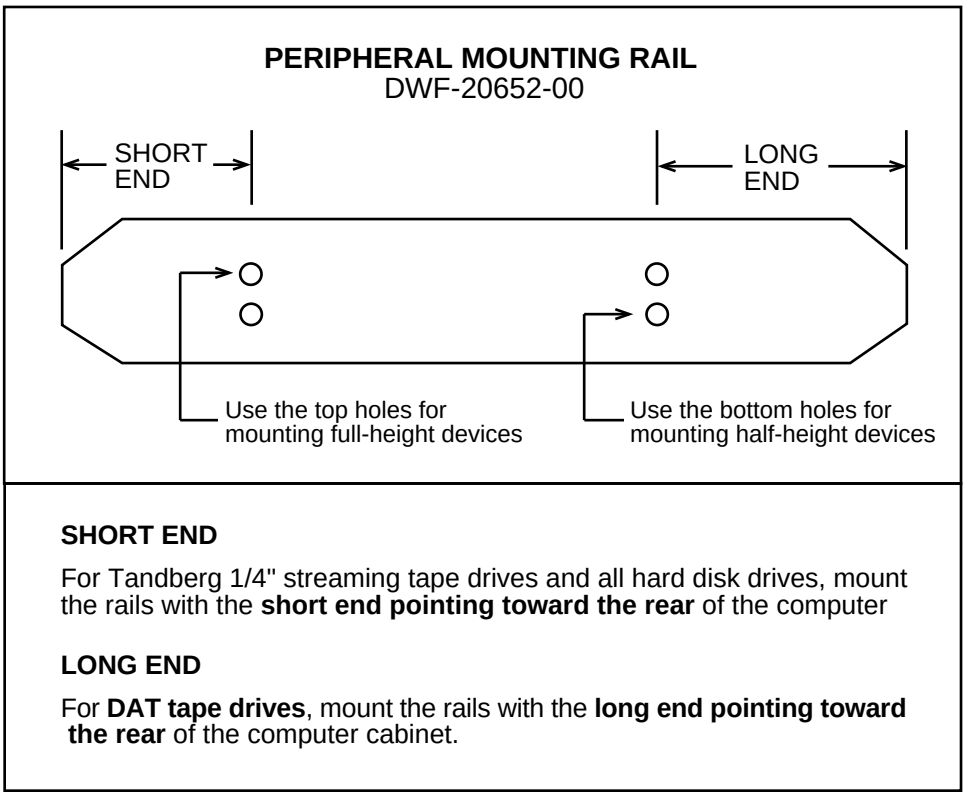


Figure 7 - Peripheral Mounting Rails

Figure 8 shows the basic peripheral/rail assembly. The peripheral mounting kit includes both standard and metric screws for compatibility with all of Alpha Micro's 5.25” peripherals.

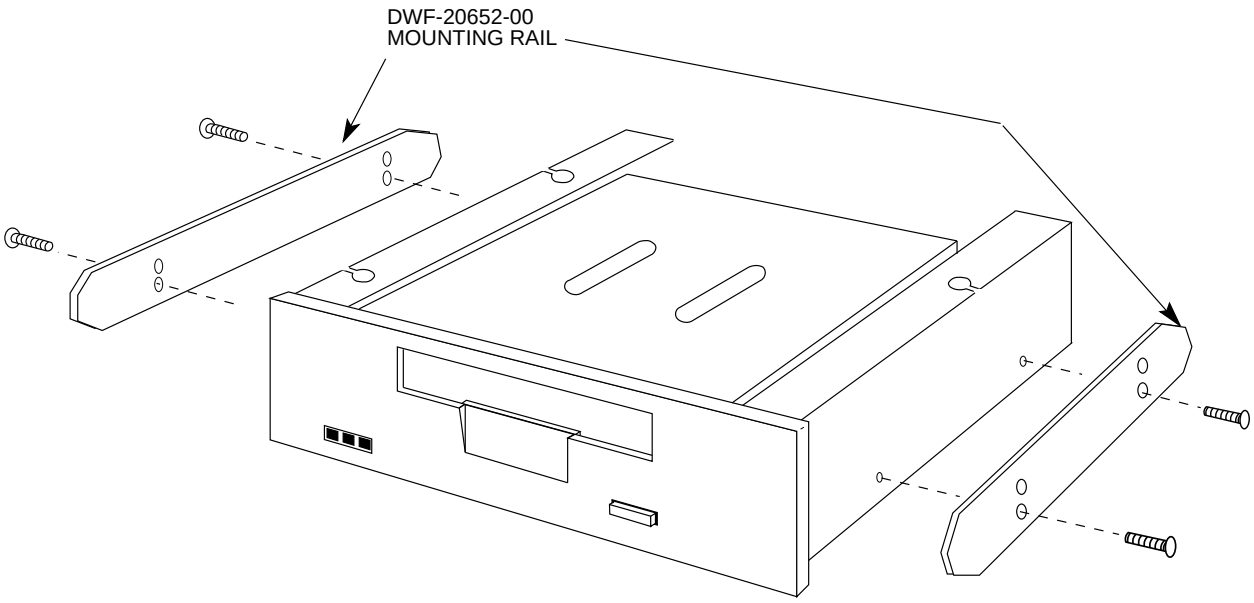


Figure 8 - Attaching Mounting Rails to Peripheral

Once the rails are installed, slide the tape drive into its mounting position in the chassis. Attach the power cable from the power supply to the four-pin connector on the drive.

Attach the Wide SCSI cable to the 68-pin connector on the drive. The drive's connector is keyed so the cable can only be attached correctly.

If you are attaching the drive to a 50-pin narrow SCSI cable, you must use an adapter between the 50-pin cable and the 68-pin connector on the drive. This adapter is provided with the AM-650.

Eagle Deskside Chassis Installation

Complete instructions for installing SCSI peripherals are included in the service manual for the Eagle and AM-6000 deskside computers. Use these instructions to install your AM-650 tape drive and then use the instructions in this document to complete the software portion of the installation.

SOFTWARE INFORMATION

There are several points to remember when using the AM-650:

- The AM-650 works only with AMOS 2.3A or later.
- You can have one or two streaming tape drives attached to your computer system.
- A single streaming tape drive must be referred to as STR0:. If you have two drives, the one with the higher SCSI ID must be STR0:; the other is STR1:.
- The device driver program, STR.DVR, must be loaded into system memory.
- If you have an AM-650 on an Eagle or Roadrunner computer which doesn't use a CMOS configuration menu, and you want to be able to warm boot from it, it must be set to a higher SCSI ID than any other tape device on the SCSI bus.

Copying the Device Driver Program

You need to copy the 625DVR.DVR streaming tape driver file to the file name STR.DVR, so AMOS can associate it with the device name (STR0:) you are going to put in your system initialization file. To do so, type:

```
LOG DVR: RETURN
COPY STR.DVR=625DVR.DVR RETURN
```

As long as you are using AMOS 2.3A or later, the driver file 625DVR.DVR is compatible with the AM-650.

Modifying the System Initialization Command File

To define the AM-650 to your computer, use the COPY command to make a copy of your system initialization command file called TEST.INI. Then edit that copy using AlphaVUE or another text editor, making the modifications described in the following sections. For example, you could use these commands:

```
LOG SYS: RETURN
COPY TEST.INI=AMOS32.INI RETURN
VUE TEST.INI RETURN
```

NEVER modify the system initialization command file directly. Always make your modifications in a copy of the file. When you have finished, use MONTST to test the new file. If it fails, you can push the reset button to return to your standard initialization file. If the MONTST is successful, you can then rename the test command file to AMOSL.INI or AMOS32.INI. If you modify your AMOSL.INI or AMOS32.INI file directly and make a mistake, the system may not boot at all!

For complete information about modifying your initialization file, see the *System Operator's Guide to the System Initialization Command File*.

MODIFYING THE TEST FILE

The DEVTBL statement in the system initialization command file tells AMOS which devices to look for on the computer. As AMOS processes the DEVTBL command lines, it builds a device table in memory. The file system consults the device table for device assignments. Every time you add a new device, like your AM-650, to the system you must add it to the system device table.

Locate the DEVTBL statements in your TEST.INI and add one that looks like this:

```
DEVTBL /STR0
```

The slash preceding the device name lets AMOS know the device is non-sharable.

If you have two streaming tape drives, enter both device names after the slash, separated by a comma, like this:

```
DEVTBL /STR0,STR1
```

The device driver program needs to be in system memory, so add the following line somewhere before the final SYSTEM command:

```
SYSTEM STR.DVR[1,6]
```

Since the MTUxxx programs spawn a separate job to communicate with the tape drive, you may need to increase the number of jobs allocated by the system at boot time. To increase the number of jobs, find the line which reads:

```
JOBS nnn
```

This line is normally one of the first commands in the .INI file. Increase the number of jobs by one.

Testing the Initialization File

When you have finished editing the TEST.INI file, save it and exit. Then, make sure everyone is off your system, log into OPR:, and use MONTST to test the TEST.INI file. For example:

```
LOG OPR: RETURN
MONTST TEST.INI[1,4] RETURN
```

When your computer executes the statement `DEVTBL /STR0` in your system initialization command file, it displays what tape drive was detected and its address. For example:

```
AM-650 streamer found at SCSI ID: 3
```

If the computer boots successfully, enter DEVTBL to see a display of the devices on your system; the SCSI streamer drive should be listed as STR0.

If you have two streaming tape drives, both should appear during initialization and on the DEVTBL display.

If the computer doesn't boot successfully, or if the streamer does not appear on the DEVTBL display, press the RESET button to reboot the computer under its original initialization file. Review the changes you made to TEST.INI, and verify the AM-650 is cabled correctly and its address jumpers are properly set.

Initial System Testing

Since you had to open the computer to install the AM-650, you may want to run the system self test to be sure your computer system is operating correctly. Refer to the *Self-Test User's Manual* for complete instructions on using the self test. Self test does not test the streaming tape drives.

Use MTUSAV to copy a few files onto a blank streaming tape cartridge, then use MTURES to restore them into a different disk account or onto another logical disk. Use the MTUDIR command to list the

files stored on the tape cartridge. If you aren't familiar with the MTUxxx commands, refer to your *System Commands Reference Manual* for instructions.

USING THE AM-650

Use only the MTUSAV, MTURES, and MTUDIR commands to write to and read from the AM-650. Do not use the older STRxxx utilities, as these are no longer supported by Alpha Micro!

The following sections discuss issues you should keep in mind while using your AM-650, especially if you read or write using different cartridge types or tape formats.

Reading and Writing Different Tape Formats

The AM-650 can read and write tapes ranging from 150MB to 13GB. It also allows you, in some cases, to choose the format to use when writing a tape. This list shows the tape cartridges you can use, and the formats supported for each:

Cartridge	Formats Supported
DC6037	QIC-150
DC6150	QIC-150
DC6250	QIC-150
DC6320	QIC-150, QIC-525
DC6525	QIC-150, QIC-525
DC9100 (Magnus 1GB)	QIC-1000
DC9120	QIC-1000
DC9200 (Magnus 2GB)	QIC-2GB
DC9250	QIC-2GB
QIC-139 (Imation 13GB)	QIC-5010, QIC-5010C

The AM-650 reads all of these cartridges and formats automatically; you just put in the tape and it figures out what kind of tape it is and what format it's written in. When determining what format to record in, the AM-650 follows these rules:

1. If the tape has previously been written to, the AM-650 writes in the same format used previously. If a 13GB tape was written in compressed mode last time, it will write in compressed mode this time, too.
2. To change recording format, use the TMODE command. TMODE lets you pick compressed or uncompressed mode (for Imation 13GB tapes), and also lets you set the recording format to either QIC-150 or QIC-525 (with DC6320 or DC6525 tapes).

   When you use TMODE, there must be a tape in the drive which supports the format you want to set. You can't set QIC-525 format with a 2GB tape in the drive!

3. Once you've used TMODE, the format you set stays in effect for all tapes until you either use TMODE again or perform a hardware reboot (not MONTST) of the computer. ***The TMODE setting overrides the format the AM-650 would otherwise use*** for the tape under rule 1, above.

This means that, if you use TMODE to set, for example, QIC-150 format, then switch tapes, the AM-650 will try to write to the new tape in QIC-150 format. If the tape does not support this format, the write operation will fail!

4. To write to a different kind of tape, you need to use TMODE again to set the proper recording format for the new tape. You need to continue to use TMODE each time you switch tapes until you reset the computer. After the reset, the AM-650 will again automatically use the correct format for each tape.

For example, you normally back up your computer using 13GB tapes. You just put the tape in: the AM-650 recognizes the cartridge type and uses the same format (compressed or uncompressed) previously used on this tape. But, one day you need to make a tape in QIC-150 format so you can transfer information to another computer using an AM-625 drive. The smallest tape you have is a DC6525. You put this tape in, then use TMODE to set the recording format to QIC-150. After transferring the data, you want to start your nightly backup. You must put in the 13GB tape, then use TMODE to set the recording format to QIC-5010 or QIC-5010C. If you don't use TMODE, the AM-650 will try to use QIC-150 format on the 13GB tape, and your backup will not work.

In summary, during normal backup and restore operations, you probably won't need to use TMODE: The AM-650 automatically uses the right format for your tapes. But, ***once you use TMODE to change format, you must continue to use it until you reset the computer***. Please see the TMODE reference sheet in the *System Commands Reference Manual* for complete instructions on using TMODE.

Spanning Tapes

The AM-650 supports tape spanning only in the QIC-150 and QIC-525 formats. Writing to larger tapes (1GB and above) does not support spanning.

If you do span tapes, you must use the same size tapes for all tapes in a save set. You cannot start a backup on a DC6150 cartridge and continue it on a DC6525.

Warm Booting

To warm boot from an AM-650, access your computer's CMOS configuration menu and make sure the alternate boot ID is set to the proper ID. See you computer *Owner's Manual* for instructions on using the CMOS menu.

On computers which use boot ID switches instead of CMOS configuration—Roadrunner 030 and 040 systems and Eagles other than the Super Eagle—the AM-650 must be set to a higher SCSI ID than any other tape drive, and the boot ID switches must be set correctly. Figure 9 shows the correct boot switch settings.

Warm booting from the AM-650 is not supported on the AM-4000. If you have an AM-650 on an AM-4000, ***do not*** set the boot ID switches to boot from the tape device. If you do, you may not be able to boot your computer at all!

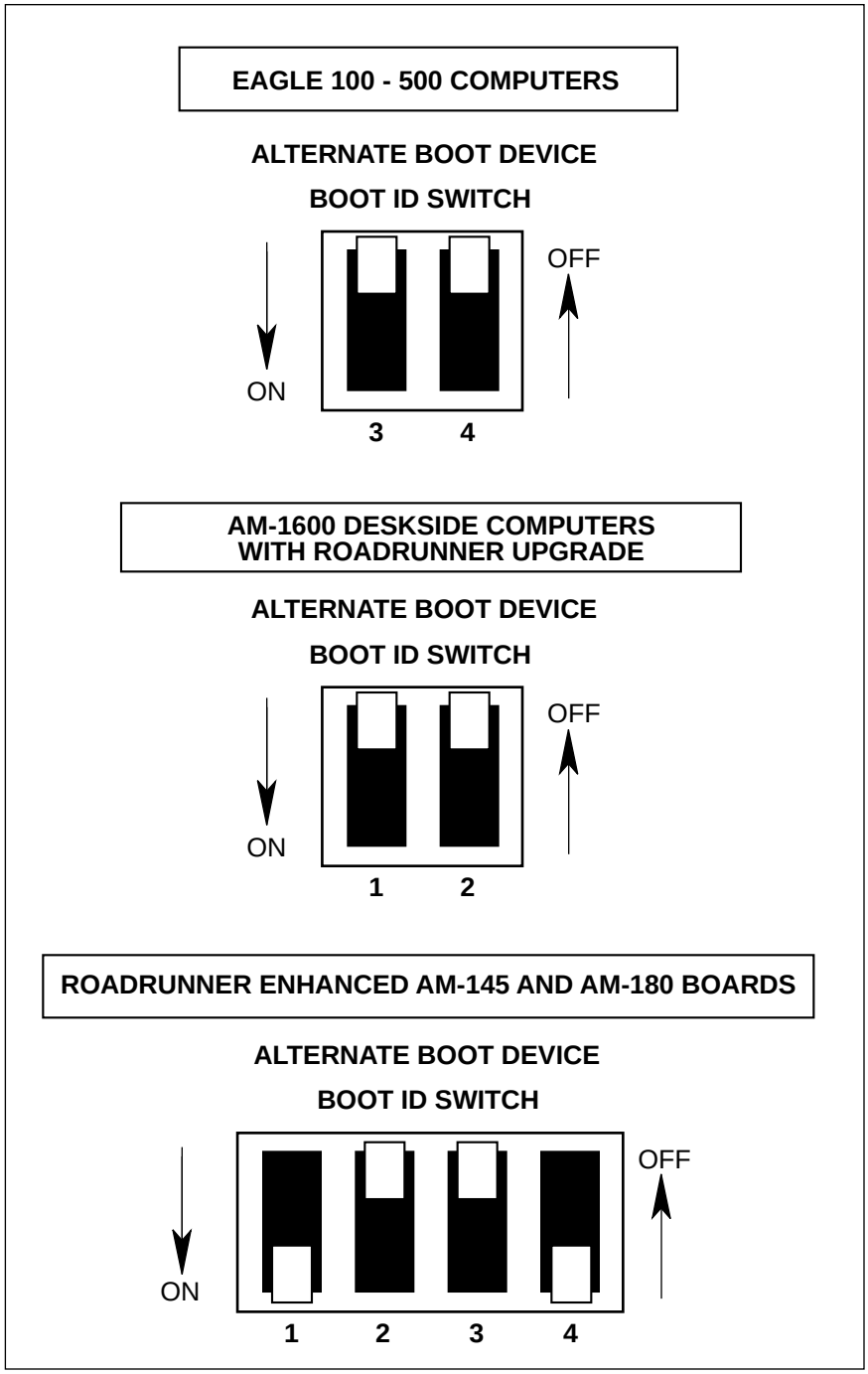


Figure 9 - Boot Switch Settings for Roadrunner/Eagle Warm Boot

To warm boot from the AM-650, the boot PROM in your computer must be of at least a minimum revision level, as shown:

CPU Board	Description	PROM Revision
AM-172	Roadrunner 030, used in some Eagle 200/300s	M00
AM-174	Roadrunner 040, used in Eagle 200 - 500 and Super Eagle (Eagle 550)	N00
AM-176 CPU	AM-6000, Roadrunner 060	A01
AM-190	AM-4000	***Not supported***

You must use CRT620 to create the warm boot tape. Since you cannot append data onto a streamer tape, a warm boot tape can contain only the warm boot monitor. You must back up your data onto a separate tape. For more information about warm booting, see your *System Operator's Guide* and the WRMGEN reference sheets in the *System Commands Reference Manual*.

Loading and Unloading Tape Cartridges

To avoid static discharge, always ground yourself by touching the metal chassis before loading or unloading a tape cartridge.

1. Hold the cartridge with the metal side down. The end of the tape cartridge with the write-protect switch will enter the drive first.
2. Insert the cartridge into the drive. When the cartridge is part way in, the drive will take it and load it into the proper position.

If you insert a tape incorrectly, the drive will reject it. Do not attempt to force a tape into the drive! If the tape does not load easily, take it back out and check its orientation.

Before unloading the tape cartridge, be sure the tape activity light (the center green LED) is out. To unload, press the tape eject and the drive will eject the tape.

AM-650 Status LEDs

There are three LEDs on the front of the AM-650, two green and one amber. They all light briefly when the drive is turned on. After that, they have these meanings:

- Left Green LED: On when there is a tape cartridge in the drive; flashing during self-test.
- Center Green LED: Flashing during any activity (tape loading, unloading, or movement).
- Amber LED: On if drive needs cleaning. Flashing if there is an unrecoverable drive failure, cartridge failure, or microcode download failure.

All LEDs flashing at once indicates a fatal trap.

Care of Streaming Tape Cartridges

A cartridge tape can store all the data on your computer, so it is worth taking care of properly. In addition to the tips for diskettes, above, remember the following:

- Store cartridges with the write-protect switch in the SAFE position.
- Keep magnets away from your tapes. Even weak magnets such as those in paper clip holders can erase data on a cartridge tape.
- Don't expose tapes to very high or low humidity (more than 80% or less than 20%).
- Cartridge tapes should be acclimated to computer-room temperature and humidity conditions before use. If the tape has been stored away from the computer, it should be returned to the computer environment at least eight hours before use. If it has been in a different environment for less than eight hours, it should be kept in the computer location for at least as many hours as it was away from it.

Cleaning the AM-650

It is very important to clean the read/write heads of your AM-650 periodically. Tandberg recommends you clean the drive once a week or every 8 hours of use, whichever comes first. They also suggest you clean the heads after using a new tape for the first time, and that you do a complete tape wind/rewind after cleaning.

When you need to clean your tape drive, use only a dry process cleaning cartridge designed for the AM-650. One is available from Alpha Micro, part number PRA-00229-00. Follow the instructions on the cleaning cartridge.

ADDITIONAL DOCUMENTATION

A number of other Alpha Micro documents amplify the concepts discussed in this document. Your primary reference source should be your computer *Owner's Manual*. Subjects thoroughly covered in the *Owner's Manual* include:

1. Physical and electrical specifications.
2. Cooling and system placement.
3. Power requirements and power conversion.
4. CMOS configuration.

Another useful document is your *System Commands Reference Manual*. In it you will find reference sheets for the AMOS system software programs and commands mentioned in this document. Also, see your *System Operator's Guide* for a wide variety of system information and the *System Operator's Guide to the System Initialization Command File* for information about system initialization configuration.